

# ABSTRACT OF THE DISCLOSURE

Electrode active materials comprising lithium or other alkali metals, a transition metal, and a phosphate or similar moiety, of the formula:



wherein

- (a) A is selected from the group consisting of Li, Na, K, and mixtures thereof, and  $0 < a < 1.0$  and  $0 \leq x \leq 1$ ;
- (b) M comprises one or more metals, comprising at least one metal which is capable of undergoing oxidation to a higher valence state, where  $0 < b \leq 2$ ; and

wherein M, a, b, and x are selected so as to maintain electroneutrality of said compound.

In a preferred embodiment, M comprises at least one transition metal selected from Groups 4 to 11 of the Periodic Table. In another preferred embodiment, M comprises  $M'_cM''_d$ , where  $M'$  is at least one transition metal from Groups 4 to 11 of the Periodic Table; and  $M''$  is at least one element from Groups 2, 3, 12, 13, or 14 of the Periodic Table, and  $c + d = b$ . Preferably,  $0.1 \leq a \leq 0.8$ . Preferred embodiments include those having a structure similar to the mineral olivine (herein "olivines"). This invention also provides electrodes comprising an electrode active material of this invention, and batteries that comprise a first electrode having an electrode active material of this invention; a second electrode; and an electrolyte.

20090923.17.030602